

Appl. No. 09/840369

In the Claims:

Listing of all claims:

1 1. (Currently Amended) An apparatus for
2 detecting a seal seals formed between successive bags on a
3 moving film moving in a machine direction, comprising;
4 a force transmitter, disposed to transmit a force
5 from the film, wherein the force is created when the film
6 moves in the machine direction with respect to the force
7 transmitter;
8 a force sensor disposed to receive the transmitted
9 force and provide a force signal in response thereto; and
10 a controller, disposed to receive the force signal
11 and provide a seal signal indicative of the presence and
12 location of the seal in response thereto.

1 2. (Original) The apparatus of claim 1, wherein
2 the force sensor is an acoustic sensor.

1 3. (Original) The apparatus of claim 1, wherein
2 the force sensor is a mechanical sensor.

1 4. (Original) The apparatus of claim 1, wherein
2 the force sensor is a vibration sensor.

1 5. (Original) The apparatus of claim 1, further
2 comprising an anvil disposed on a first side of a film path,
3 wherein the force transmitter is disposed on a second side of the
4 film path.

1 6. (Original) The apparatus of claim 1, wherein
2 the force sensor is a piezoelectric sensor.

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1 7. (Original) The apparatus of claim 5, wherein
2 the force transmitter is a quill disposed near a path of the
3 film.

1 8. (Original) The apparatus of claim 6, wherein
2 the quill is rigid.

1 9. (Original) The apparatus of claim 7, wherein
2 the quill is comprised of stainless steel.

1 10. (Original) The apparatus of claim 6, wherein
2 the quill is angled in a downstream film path direction, relative
3 to normal to the film path.

1 11. (Original) The apparatus of claim 10, wherein
2 the quill includes a radius surface abutting the film path; and
3 the quill is held against the film path by a spring force.

1 12. (Original) The apparatus of claim 5, wherein
2 the controller includes an amplitude comparator that receives the
3 force signal and an amplitude threshold.

1 13. (Original) The apparatus of claim 5, wherein
2 the controller includes a rise-time comparator that receives the
3 force signal and a rise-time threshold.

1 14. (Original) The apparatus of claim 1, wherein the
2 controller includes a window circuit.

1 15. (Currently Amended) A method for detecting a
2 seal formed between successive bags on a moving film moving
3 in a machine direction, comprising;

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4 creating a force when the film moves in the
5 machine direction relative to a sensor;
6 providing a force signal responsive to the seal;
7 and
8 detecting the force and providing a seal signal
9 indicative of the presence and location of the seal in
10 response thereto.

1 16. (Original) The method of claim 15, further
2 comprising transmitting a force from the film.

1 17. (Original) The method of claim 15, wherein
2 providing the force signal includes detecting an acoustic signal.

1 18. (Original) The method of claim 16, wherein
2 providing the force signal includes detecting a mechanical
3 signal.

1 19. (Original) The method of claim 16, wherein
2 providing a force signal includes sensing a vibration.

1 20. (Original) The method of claim 15, further
2 comprising transmitting the force with a quill disposed near a
3 path of the film.

1 21. (Original) The method of claim 15, wherein
2 providing a seal signal includes comparing an amplitude of the
3 force with a threshold.

1 22. (Original) The method of claim 21, wherein
2 providing a seal signal includes making the comparison during a
3 window.

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1 23. (Original) The method of claim 22, wherein
2 providing a seal signal includes comparing a rise-time of the
3 force with a threshold.

1 24. (Currently Amended) An apparatus for
2 detecting a seal formed between successive bags on a moving
3 film moving in a machine direction, comprising;
4 means for providing a force signal in response to
5 the seal and a force, wherein the force is created when the
6 film moves in the machine direction;
7 means for detecting the force signal, coupled to
8 the means for providing a force signal; and
9 means for providing a seal signal indicative of
10 the presence and location of the seal in response to the
11 force signal, coupled to the means for detecting.

1 25. (Original) The apparatus of claim 24, further
2 comprising means for transmitting a force from the film to the
3 means for detecting, coupled to the means for detecting.

1 26. (Original) The apparatus of claim 25, wherein
2 the means for detecting includes means for detecting an acoustic
3 signal.

1 27. (Original) The apparatus of claim 25, wherein
2 the means for detecting includes means for detecting a mechanical
3 signal.

1 28. (Original) The apparatus of claim 25, wherein
2 the means for detecting includes means for detecting a vibration
3 signal.

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1 29. (Original) The apparatus of claim 25, wherein
2 the means for providing a seal signal includes means for
3 comparing an amplitude of the force with a threshold.

1 30. (Original) The apparatus of claim 29, wherein
2 the means for providing a seal signal includes means for making
3 the comparison during a window.

1 31. (Original) The apparatus of claim 30, wherein
2 the means for providing a seal signal includes means for
3 comparing a rise-time of the force with a threshold.

1 32. (Currently Amended) A machine, comprising;
2 a force transmitter, disposed to transmit a force
3 responsive to a seal formed between successive bags on a
4 continuous film moving in a machine direction on a bag,
5 wherein the force is created as the bag moves in the machine
6 direction relative to the transmitter;
7 a force sensor disposed to receive the transmitted
8 force and provide a force signal in response thereto;
9 at least one upstream processing device, located
10 upstream of the force transmitter;
11 at least one downstream processing device, located
12 downstream of the force transmitter; and
13 a controller, disposed to receive the force signal
14 and provide a seal signal indicative of the presence and
15 location of the seal in response thereto.

1 33. (Original) The apparatus of claim 32, wherein
2 the force sensor is a mechanical sensor.

1 34. (Original) The apparatus of claim 32, further
2 comprising an anvil disposed on a first side of a film path,

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3 wherein the force transmitter is disposed on a second side of the
4 film path.

1 35. (Original) The apparatus of claim 34, wherein
2 the force sensor is a piezoelectric sensor.

1 36. (Original) The apparatus of claim 35, wherein
2 the force transmitter is a quill disposed near a path of the
3 film.

1 37. (Original) The apparatus of claim 36, wherein
2 the quill is angled downstream.

1 38. (Original) The apparatus of claim 37, wherein
2 the quill includes a radius surface abutting the film path, and
3 the quill is held against the film path by a spring force.

1 39. (Original) The apparatus of claim 38, wherein the
2 controller includes a window circuit.

1 40. (Original) The apparatus of claim 32, wherein one
2 of the at least one downstream devices is registered to the seal.

1 41. (Original) The apparatus of claim 40, wherein one
2 of the at least one downstream devices includes a knife.

1 42. (Original) The apparatus of claim 40, wherein one
2 of the at least one downstream devices and the force transmitter
3 are in a common tension zone.

1 43. (Currently Amended) A method for processing
2 a bag plurality of bags formed from successive seals on a
3 continuous film, comprising;

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4 transporting the film from a first processing
5 device to a seal sensing location, and past the seal sensing
6 location in a machine direction;
7 providing a force signal responsive to the seal
8 and a force at the seal sensing location, wherein the force
9 is created by the seal moving in the machine direction;
10 detecting the force and providing a seal signal
11 indicative of the presence and location of the film in
12 response thereto;
13 transporting the film to a second processing
14 device.

1 44. (Original) The method of claim 43, further
2 comprising transmitting a force from the film.

1 45. (Original) The method of claim 44, wherein
2 providing the force signal includes detecting a mechanical
3 signal.

1 46. (Original) The method of claim 43, wherein
2 providing a seal signal includes comparing an amplitude of the
3 force with a threshold.

1 47. (Original) The method of claim 46, wherein
2 providing a seal signal includes making the comparison during a
3 window.

1 48. (Original) The method of claim 43, wherein
2 providing a seal signal includes comparing a rise-time of the
3 force with a threshold.